

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended): An n-type semiconductor diamond, characterized by a making method comprised of:

mechanically polishing a (100) diamond surface to make it in an inclined diamond substrate;

subjecting a surface of said inclined diamond substrate to a hydrogen plasma treatment to make said substrate surface to consist of steps each in the order of an atomic layer; and

subjecting said substrate surface consisted of steps each in the order of an atomic layer to an exited raw material gas made of a volatile hydrocarbon compound, a sulfur compound and a hydrogen gas by a microwave plasma to cause n-type semiconductor diamond to grow epitaxially on said surface consisted of steps each in the order of an atomic layer,

wherein said n-type semiconductor has a single donor level of 0.38 eV, which is sufficient to allow operation of said n-type semiconductor diamond as p-n junction device.

2. (canceled)

² ~~3~~ (currently amended): A method of making an n-type semiconductor diamond, characterized in that it comprises:

mechanically polishing a diamond substrate to make it in an inclined diamond substrate, which is formed by mechanically polishing a diamond (100) face oriented substrate so that its face normal is inclined at an angle between 1.5 and 6 degrees with respect to its <100> direction in a plane made by either its <100> and <010> directions or its <100> and <001> directions;

subjecting a surface of said inclined diamond substrate to a ~~smoothing~~
hydrogen plasma treatment to make it even; and

exciting a raw material gas made of a volatile hydrocarbon compound, a sulfur compound and a hydrogen gas by a microwave plasma while maintaining at a given temperature said substrate surface smoothed as aforesaid to cause an n-type semiconductor diamond to grow epitaxially on said smoothed substrate.

³ ~~4~~ (previously presented): A method of making an n-type semiconductor diamond as set forth in claim ~~3~~², characterized in that said diamond substrate is a diamond (100) face oriented substrate.

5. (canceled)

⁴ ~~6~~ (currently amended): A method of making an n-type semiconductor diamond as set forth in claim ~~3~~², characterized in that said ~~smoothing~~ hydrogen plasma treatment comprises a treatment of exposing said inclined substrate to the hydrogen plasma of a hydrogen pressure of 10 to 50 Torr and a microwave output of 200 to 1200

W at a substrate temperature of 700 to 1200 °C for a period of 0.5 hours to 5 hours,
thereby to make even said substrate surface to consist of steps each in the order of an
atomic layer.

~~5~~ ~~11.~~ (previously presented): A method of making an n-type semiconductor
diamond as set forth in claim ~~3~~², characterized in that said given substrate temperature is
between 700 and 1100 °C.

8-19. (canceled)

~~6~~ ~~20.~~ (previously presented): A method of making an n-type semiconductor
diamond as set forth in claim ~~7~~⁵, characterized in that said given substrate temperature is
830°C.